



Claim Appendix

Appeal of Final Rejection

in Second CPA of Serial No. 09/127,256 Naming

William Elkins as Inventor

1. A heat exchange panel to be conformed to a complex shape, comprising:

a first layer of a flexible material, which layer is conformable to a complex shape;

a second layer of a flexible material, which layer also is conformable to a complex shape and has a common border with the first layer;

a border seal sealing the first layer and the second layer at said border;

and

said first and second layers being directly secured together interiorly of said border at a multiplicity of points to form a dot matrix of attachments organized into first imaginary lines and second imaginary lines for connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in a range of between about 70° to 100°.

3. The panel of claim 1, wherein:

the border seal includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of said border.

4. The panel of claim 3, further comprising:

a first port for passing a fluid into the panel;

a second port for passing said fluid out of the panel; and

at least one fence interiorly of said border sealing the first layer and the second layer, said fence cooperating with said border to define a fluid flow channel within said panel.

5. The panel of claim 4, wherein:

the fence includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of the fence.

6. A method of manufacturing a heat exchange panel which conforms to a complex shape comprising the steps of:

sealing a first layer of a flexible material, which layer is conformable to a complex shape to a second layer of a flexible material at a common border, which second layer is also conformable to a complex shape; and

sealing said first layer to said second layer interiorly of said border at a multiplicity of points to form a dot matrix of attachments, said dot matrix organized into first imaginary lines and second imaginary lines for connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in a range of between about 70° to 110°.

8. The method of claim 6, wherein:

the first step of sealing includes sealing said first layer to said second layer with a border seal having curvilinear ripples having ripple cycle lengths substantially shorter than the length of said border.

9. The method of claim 6, further comprising steps of:

constructing first and second ports for passing a fluid into and out of said panel; and

sealing said first layer to said second layer with at least one fence between said first port and said second port, said fence having curvilinear ripples having ripple cycle lengths substantially shorter than the length of said fence.

10. A method for exchanging heat with a complex shape, comprising the steps of:

receiving a fluid flow in a first port;

restricting passage of said fluid flow to between first and second layers of flexible material which are conformable to a complex shape;

further restricting said passage with a border seal at a common border between said first and said second layers;

passing said fluid flow about a multiplicity of points interiorly of said first and second layers, said first and second layers being directly secured together to form a dot matrix of attachments organized into first imaginary lines and second imaginary lines connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in a range of between about 70° to 110°; and

issuing said fluid flow through a second port.

12. The method of claim 10, wherein:

said border seal includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of said border.

13. The method of claim 10, further comprising a step of:

further restricting said fluid flow with at least one fence between said first port and said second port.

14. The method of claim 13, wherein:

said fence includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of the sealing fence.

15. A system for exchanging heat with a complex shape; comprising:

a heat transfer device for one of cooling or heating a fluid;

a pump/reservoir coupled to the heat transfer device for storing and pumping said fluid; and

a heat exchange panel coupled to the pump/reservoir and the heat transfer device, the heat exchange panel including a first layer of a flexible material conformable to a complex shape, a second layer of a flexible material also conformable to a complex shape, a border seal sealing said first layer and said second layer together at said border, a first port for receiving said fluid, a second port contiguous with said first port for issuing said fluid, and said first and second layers being directly sealed together interiorly of said border seal to form a dot matrix of attachments between said first and second layers, said dot matrix organized into first imaginary lines and second imaginary lines for connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in the range of between about 70° to 110°.

16. The system of claim 15, wherein:

one of (i) said first lines and (ii) said second lines has an angle in a range of about 25° to 65° with respect to a nominal direction of a flow of said fluid.

17. The system of claim 15, wherein:

said border seal includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of said border.

18. The system of claim 15, wherein:

the heat exchange panel further includes at least one fence interiorly of the border sealing said first layer and said second layer, said fence cooperating with said border to define a fluid flow channel within said panel.

19. The panel of claim 18, wherein:

said fence includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of said fence.

20. The panel of claim 4 wherein said first and second ports are contiguous.

22. A heat exchange panel to be conformed to a complex shape, comprising:

a first layer of a flexible material, which layer is conformable to a complex shape;

a second layer of a flexible material, which layer also is conformable to a complex shape;

a border seal sealing the first layer and the second layer to form a border, the border seal including curvilinear ripples having ripple cycle lengths substantially shorter than the length of said border.

23. The heat exchange panel of claim 22 further including at least one fence interiorly of said border, which fence is sealed to the first layer and the second layer and includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of the fence.

24. The heat exchange panel of claim 23 further including a first port for passing fluid into the panel and a second port for passing said fluid out of the panel, said first and second ports being contiguous.